

Rejuvenation

Rejuvenation is America's largest manufacturer and a leading direct marketer of period-authentic lighting and house parts. Shipping and receiving everything from glass lamp shades to switch plates and highly-polished brass lamp fixtures, Rejuvenation is also a major user of packaging, particularly corrugated boxes. Even though corrugated is highly recyclable and can be made with high levels of recycled content, its manufacture – like that of all packaging materials – still requires energy and creates pollution. Rejuvenation has accomplished major reductions in environmental impacts of its packaging through a successful box reuse effort. Rejuvenation sorts out and redeploys for reuse around two-thirds of all of the “waste” boxes that have the potential to be reused. (Other potentially reusable boxes, as well as boxes that can't be reused, are recycled.) This has cut Rejuvenation's purchase of new boxes by almost 25%, saving approximately \$23,000 (net) and reducing waste generation by approximately 30 - 40 tons per year.

Background

Rejuvenation is America's largest manufacturer and a leading direct marketer of period-authentic lighting and house parts. Homeowners and design professionals alike order its products via mail order, online or through the company's retail stores in Portland and Seattle. A third store is planned for 2006.

Lighting and house parts are manufactured at a facility in Northwest Portland. This same facility also serves as Rejuvenation's warehouse and order fulfillment center, both for products manufactured in-house as well as finished goods manufactured elsewhere. Many different shipping and receiving functions are performed at this facility, with associated packaging impacts:

- Supplies and component parts used in manufacturing and distribution are received from vendors.
- Finished products from vendors are also received and inventoried.
- Certain manufacturing steps, such as plating, occur off-site, so Rejuvenation ships partially-finished product from the facility and subsequently receives back the same product later in the production cycle.
- Products are shipped from the facility to Rejuvenation's retail stores for restocking and will call.
- All catalog and internet orders are filled at this facility.
- This facility also handles returns.

Box Reuse: How it Works

Whenever possible, catalog products manufactured off-site by third-party suppliers are shipped to customers in their original packaging. But Rejuvenation also receives large quantities of boxes with the component parts and supplies that are used to manufacture and assemble products on-site. These boxes, once emptied, are kept near the packing stations in moveable bins. Packers will then determine if they can reuse any of the boxes that are in these bins. At the end of the day the bins are flattened and emptied into larger staged containers. The staged boxes are accessible to all warehouse employees. Employees can also pick boxes directly from these staged containers. When the staged containers fill up, they are emptied into the compactor for recycling.

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All warehouse employees participate in box reuse. Employees are reminded of the box reuse program during smaller department meetings, when considering company wide initiatives, and during conversations about environmental sustainability.

In order to be reused by Rejuvenation, a box needs to meet the following criteria:

- No staples -- safe and easy to flatten
- Structurally sound
- Appropriate size
- Free of postage, address labels, tracking codes, bill-of-lading packets, and other markings that could cause confusion during mailing
- Minimal other markings (tags, vendor names, writing, etc.)

Rejuvenation uses these reused boxes for three different functions:

- Inter-company manufacturing transfers: as part of the manufacturing cycle, Rejuvenation ships certain unfinished products to off-site manufacturers for services such as plating. Reused boxes are used exclusively for this application.
- Shipping to retail stores: approximately 60% of all shipments to retail stores are shipped in reused vendor boxes.
- Catalog/Internet order fulfillment: reused boxes are used where possible for direct shipments to customers.

Material Flows and Environmental Benefits

To better understand Rejuvenation’s box reuse program, and identify potential areas for improvement, an outside group of waste reduction specialists (from the Oregon DEQ, Metro and the City of Portland) worked with Rejuvenation to conduct a “box reuse study”. The study involved characterizing the flow of corrugated boxes through Rejuvenation’s facility. The facility’s recycling baler was locked down for a week, allowing boxes separated for recycling to accumulate. These boxes were sorted and categorized based on their reuse potential. (For a summary of the results of this study, [click here](#).)

The study was conducted in May of 2003. Since that time, Rejuvenation has undergone significant growth, so these numbers are no longer current. Regardless, results from May 2003 provide a valuable “snapshot” of a highly-efficient box reuse program:

Boxes Reusable by Rejuvenation

Already separated for reuse	4,100 – 4,900/month ¹
Potential reusable but placed in recycling	<u>300 – 500/month</u>
Totals	4,400 – 5,400/month
“Capture Rate”:	89 – 94%

“Reuse” vs. “Recycling”: What’s the Difference?

To the casual observer, “reuse” and “recycling” may be one and the same. In fact, many people use the word “recycling” when talking about “reuse”. But from both a financial and an environmental standpoint, “reuse” and “recycling” are very different.

In the case of boxes, **reuse** involves using the box again, thus avoiding the need to purchase a new box. In contrast, **recycling** involves sending old boxes to a paper mill, where they are repulped to make new products. Both activities reduce waste and can save money, but reuse is typically preferable. Like recycling, reuse saves on disposal fees. But reuse also saves money as fewer new boxes have to be purchased.

Making a box from recycled corrugated requires less energy when compared to producing boxes entirely from wood. But reusing a box means one less box is produced entirely, with greater resource savings and pollution reduction. That’s why both the EPA and the State of Oregon say that while recycling is good, reuse is often environmentally preferable.

¹ This includes approximately 320 boxes/month used in inter-company transfers (manufacturing), 760 boxes/month used for shipping to Rejuvenation’s retail operations, and somewhere between 3,000 and 3,800 reused boxes/month utilized in customer order fulfillment. These estimates were valid for mid-2003.

Of all of the boxes that are potential reusable by Rejuvenation, approximately 90% were being sorted properly and kept out of the recycling piles at the time of this study (the “capture rate”). Clearly, employees were doing an excellent job at keeping reusable boxes out of the recycling system.

This level of box reuse helped Rejuvenation avoid the purchase of approximately 40 tons of new corrugated boxes per year. At 2003 levels of box reuse, energy savings were approximately one billion BTUs². Using EPA estimates, this box reuse program had a greenhouse gas benefit of approximately 90 metric tons of carbon dioxide per year, or the same as taking about 16 cars off of the road.

Since the time of the box reuse study, Rejuvenation has undergone a period of substantial and rapid growth, leading to short-term capacity constraints in both labor and floor space. As a result, as of the time of this publication (mid-2005), levels of box reuse are estimated to be down approximately 25%. Rejuvenation plans to re-evaluate its box reuse program with the goal of regaining, if not surpassing, its earlier high levels of reuse. One of the lessons Rejuvenation has learned from this change is that the reuse program does require a minimal level of attention, particularly during times of rapid business expansion. Changes in the level of reuse reflect changes in the level of attention given to the program.

Financial Analysis

Box reuse isn't necessarily fast or convenient. Rejuvenation has found that reusing boxes successfully takes effort, and effort requires expense. All discarded boxes are tossed into the same bins. Grabbing boxes for reuse from these bins, as opposed to taking new boxes from the shelves, adds an estimated 10 hours of labor per week.

However, where reuse has its financial benefit is in procurement savings. The estimated 3,100 boxes reused per month (as of mid-2005) reduce purchasing costs by around \$2,500 per month (at an average cost of \$0.80 per new box).

Figure 1 compares these costs on a monthly basis. Procurement savings are significantly higher than added labor costs. There is no impact on recycling revenue as Rejuvenation is neither paid for, nor charged for, corrugated recycling.

Figure 1. Annual Financial Comparison of Box Reuse to Box Recycling, Rejuvenation

Procurement Savings, Box Reuse	\$29,700/year
<u>Labor Savings (Costs), Box Reuse</u>	<u>(\$6,800/year)</u>
Net Savings (Cost), Box Reuse (compared to box recycling)	\$22,900/year

Alternative formats (such as large type, Braille) of this document can be made available. Contact DEQ's Office of Communications & Outreach, Portland, at (503) 229-5317

² BTU = British thermal Unit While corrugated linerboard and medium mills obtain much of their energy from process and other wood wastes, this energy savings is equivalent to the combustion energy in approximately 8,400 gallons of gasoline.